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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,081	03/18/2005	Khaliq Ahmed	0446-0171PUS1	4223
2292 7590 02/28/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER RIDLEY, BASIA ANNA	
			ART UNIT	PAPER NUMBER
			1764	
SHORTENED STATUTORY PERIOD OF RESPONSE		NOTIFICATION DATE	DELIVERY MODE	
3 MONTHS		02/28/2007	ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary

Application No.

10/510,081

Applicant(s)

AHMED, KHALIQ

Examiner

Basia Ridley



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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20041004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 27-30 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: any structural elements of the claimed system.
3. Claims 27-30 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: any structural relationship between elements of the claimed system.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 16, 18-24, 26-27 and 29-30 are rejected under 35 U.S.C. 102(a) as being anticipated by Jeschke (DE 100 19 548 A1).

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Regarding claims 16 and 18-24 Jeschke discloses a method of generating hydrogen for use in a fuel cell system, comprising the steps of:

- processing a fuel which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream ([0001]-[0010] and claims 3-4);
- wherein the fuel which is processed contains at most 1 ppm by volume sulfur (claims 3-4);
- wherein the fuel which is processed contains at most 0.1 ppm by volume sulfur (claims 3-4);
- wherein the fuel which is processed is entirely free of sulfur (claims 3-4);
- wherein the fuel which is processed is selected from bioethanol, biodiesel, rapeseed oil, rapeseed methyl ester, canola oil, canola methyl ester, corn oil, hemp oil, switch grass oil, fatty acid methyl esters, linseed oil, linseed methyl ester, sunflower oil, sunflower oil methyl ester, soy bean oil, palmitic acid, lauric acid, stearic acid, lanoleic acid and mixtures of any two or more of these (claims 3-4);
- wherein the fuel is processed to produce a hydrogen-containing stream using a steam reformer, autothermal reformer or partial oxidation reactor ([0012]-[0017]).

Regarding claims 18-19, while Jeschke does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding claim 26, Jeschke discloses a method of operating a fuel cell system, comprising generating a hydrogen-containing stream, comprising the steps of:

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- processing a fuel which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream ([0001]-[0010] and claims 3-4).

Regarding claims 27 and 29-30, Jeschke discloses a fuel processor which is used to produce a hydrogen containing stream from a fuel which is essentially free of organic sulfur-containing compounds ([0001]-[0010] and claims 3-4).

Regarding claims 29-30, while Jeschke does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding limitations recited in claims 27 and 29-30 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

6. Claims 16, 18-22, 24, 26-27 and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnssen (USP 5,795,666).

Regarding claims 16, 18-22 and 24 Johnssen discloses a method of generating hydrogen for use in a fuel cell system, comprising the steps of:

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- processing a fuel which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (C1/L29-C2/L6, C4/L22-51);
- wherein the fuel which is processed contains at most 1 ppm by volume sulfur (C1/L29-C2/L6, C4/L22-51);
- wherein the fuel which is processed contains at most 0.1 ppm by volume sulfur (C1/L29-C2/L6, C4/L22-51);
- wherein the fuel which is processed is entirely free of sulfur (C1/L29-C2/L6, C4/L22-51);
- wherein the fuel is processed to produce a hydrogen-containing stream using a steam reformer, autothermal reformer or partial oxidation reactor (C4/L22-51).

Regarding claims 18-19, while Johnssen does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding claim 26, Johnssen discloses a method of operating a fuel cell system, comprising generating a hydrogen-containing stream, comprising the steps of:

- processing a fuel which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (C1/L29-C2/L6, C4/L22-51).

Regarding claims 27 and 29-30, Johnssen discloses a fuel processor which is used to produce a hydrogen containing stream from a fuel which is essentially free of organic sulfur-containing compounds (C1/L29-C2/L6, C4/L22-51).

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Regarding claims 29-30, while Johnssen does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding limitations recited in claims 27 and 29-30 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

7. Claims 16-19 and 24-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Buswell et al. (USP 5,360,679).

Regarding claims 16-19 and 24-25 Buswell et al. discloses a method of generating hydrogen for use in a fuel cell system, comprising the steps of:

- processing a fuel (4) which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (6, 11);
- wherein the hydrogen-containing stream (11) is used for hydrodesulfurisation (158) of a primary hydrocarbon fuel (0) supplied to the fuel cell system;
- wherein the fuel is processed to produce a hydrogen-containing stream using a steam

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reformer, autothermal reformer or partial oxidation reactor (168);

- wherein the hydrogen-containing stream (11) is mixed with a primary fuel (0) and delivered to a hydrogenation catalyst (158) where organic sulfur-containing compounds in the primary fuel are converted to H₂S and/or non-sulfur-containing hydrocarbons.

Regarding claims 18-19, while Buswell et al. does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding claim 26, Buswell et al. discloses a method of operating a fuel cell system, comprising generating a hydrogen-containing stream, comprising the steps of:

- processing a fuel (4) which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (6).

Regarding claims 27-30, Buswell et al. discloses a fuel processor which is used to produce a hydrogen containing stream (6, 11) from a fuel (4) which is essentially free of organic sulfur-containing compounds; wherein the hydrogen-containing stream (11) is used for hydrodesulfurisation (158) of a primary hydrocarbon fuel (0) supplied to the fuel cell system.

Regarding claims 29-30, while Buswell et al. does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used

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during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding limitations recited in claims 27-30 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buswell et al. (USP 5,360,679).

Regarding claims 20-22 Buswell et al. discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose to what degree the fuel is desulfurized. As the instant application is silent to unexpected results, it would have been an obvious choice for an ordinary artisan at the time of the invention to perform said desulfurization process until the amount of sulfur in the fuel falls below a predetermined level, for example at most 1 ppm by volume sulfur or at most 0.1 ppm by volume sulfur even entirely free of sulfur, in order to

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maximize efficiency of the reformer operation by balancing the cost of sulfur removal with the cost inefficient operation caused by sulfur poisoning of downstream catalyst and eventually with the cost of said catalyst replacement. See *In re Sovish*, 769 F.2d 738, 742-43, 226 USPQ 771, 774 (Fed. Cir. 1985); and *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buswell et al. (USP 5,360,679) in view of Jeschke (DE 100 19 548 A1).

Regarding claim 23 Buswell et al. discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the process wherein the fuel which is processed is selected from bioethanol, biodiesel, rapeseed oil, rapeseed methyl ester, canola oil, canola methyl ester, corn oil, hemp oil, switch grass oil, fatty acid methyl esters, linseed oil, linseed methyl ester, sunflower oil, sunflower oil methyl ester, soy bean oil, palmitic acid, lauric acid, stearic acid, lanoleic acid and mixtures of any two or more of these.

Jeschke teaches that fuels selected from bioethanol, biodiesel, rapeseed oil, rapeseed methyl ester, canola oil, canola methyl ester, corn oil, hemp oil, switch grass oil, fatty acid methyl esters, linseed oil, linseed methyl ester, sunflower oil, sunflower oil methyl ester, soy bean oil, palmitic acid, lauric acid, stearic acid, lanoleic acid and mixtures of any two or more of these can be successfully used in reforming processes to provide hydrogen for fuel cells ([0001]-[0012] and claims 3-4). Additionally, it is clear from the Jeschke disclosure that said fuels are free of sulfur and therefore using of said fuel would eliminate the necessity of sulfur removal from the fuel of Buswell et al.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use the fuel of Jeschke, as set forth above, in the process of Buswell et al. for the

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purpose of maximizing efficiency of the reformer operation by balancing the cost of sulfur removal with the cost using fuel of Jeschke. See *In re Sovish*, 769 F.2d 738, 742-43, 226 USPQ 771, 774 (Fed. Cir. 1985); and *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

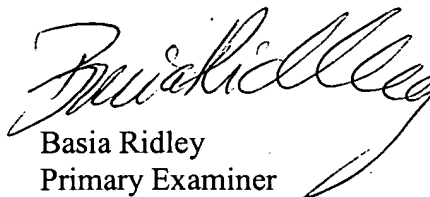
Conclusion

11. In view of the foregoing, none of the claims are allowed.
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).


Basia Ridley
Primary Examiner
Art Unit 1764

BR
February 20, 2007